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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/530,720	04/08/2005	Masahiro Kimata	403368/SAKAI	2094
23548	7590	11/08/2006	EXAMINER	
LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960			BEHM, HARRY RAYMOND	
			ART UNIT	PAPER NUMBER
			2838	

DATE MAILED: 11/08/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/530,720	KIMATA ET AL.	
	Examiner	Art Unit	
	Harry Behm	2838	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9, 11 and 15 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-2 and 8-9 is/are rejected.
- 7) ☒ Claim(s) 3-7 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

Applicant's arguments with respect to claims 1-9, 11 and 15 have been considered but are moot in view of the new ground(s) of rejection.

The indicated allowability of claim 2 is withdrawn in view of the newly discovered reference(s) to Xu (US 5,552,977). Rejections based on the newly cited reference(s) follow.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2 and 8-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Xu (US 5,552,977).

With respect to Claim 1, Xu discloses an apparatus (Fig. 1 106) for controlling a power converter (Fig. 1 100) in which an output voltage is controlled by pulse-width-modulation control [SVPWM], the apparatus comprising: a voltage-vector control unit (Fig. 1 generates V_s^*) that determines, based on a voltage instruction value for the power converter, voltage vectors [vector V_s^*] output from the power converter in one control cycle of the pulse-width-modulation control and durations [t_0, t_1, t_2] of outputting of the voltage vectors; a voltage-vector adjusting unit that adjusts (Fig. 8) the durations of outputting of the voltage vectors so that the duration [at step 122, the time of the zero

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vector t_0 is compared to the fixed duration of 0, if the duration is less than zero it is set to zero at step 126; if the duration is greater than or equal to zero, the duration will be greater than the fixed time or will be zero] of outputting of a zero-voltage vector $[t_0]$ is either longer than a fixed duration (Fig. 8 124) or is zero (Fig. 8 126); and a firing-pulse generating unit (Fig. 1 106) that generates a signal for turning on and off a semiconductor switching element (Fig. 1 SA+) included in the power converter based on the durations of outputting of the voltage vectors as adjusted by the voltage-vector adjusting unit.

With respect to Claim 2, Xu discloses the apparatus according to claim 1, wherein the voltage-vector adjusting unit adjusts the durations of outputting of the voltage vectors so that when the durations of outputting of the zero-voltage vector $[t_0]$ is longer (Fig. 8 124) than a predetermined duration $[0]$, the duration of outputting the zero-voltage vector is ensured at least for the fixed duration $[t_0'=t_0]$, and when the durations of outputting of the zero-voltage vector is shorter $[t_0<0]$ than the predetermined duration $[0]$, the duration of outputting of the zero-voltage vector becomes zero (Fig. 8 126).

With respect to Claim 8, Xu discloses the apparatus according to claim 1, wherein the voltage-vector adjusting unit adjusts the durations (Fig. 8 126) of outputting of the voltage vectors so that the durations of outputting of the zero-voltage vector $[t_0]$ is ensured at least for the fixed durations $[t_0 \text{ is at least } 0]$.

With respect to Claim 9, Xu discloses the apparatus according to claim 1, wherein the voltage-vector adjusting unit adjusts durations of outputting of the voltage

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vectors so that the durations of outputting of the zero-voltage vector [t0] is ensured at least for the fixed time [0] without changing relative ratio of output durations of voltage vectors [t1 and t2] other than the zero-voltage vector [t0].

Allowable Subject Matter

Claims 3-7, 11 and 15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter:

With respect to Claim 3, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, wherein if a total of the duration of outputting of the zero-voltage vector in more than one control cycle is shorter than a predetermined time, the voltage-vector adjusting unit adjust the duration of outputting of the zero voltage so that duration of outputting of the zero-voltage vector between two adjacent cycles becomes zero.

With respect to Claim 4, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, wherein the voltage vector adjusting unit adjusts the durations of outputting of the voltage vectors so that durations of outputting identical voltage vectors in more than one control cycle are grouped into one.

With respect to Claim 5, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, so that one

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of durations of outputting of a zero-voltage vector at a current cycle becomes zero, and an amount of the one of the durations of outputting of the zero-voltage vector is distributed to another of the durations of outputting the zero-voltage vector.

With respect to Claim 6, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, wherein the voltage vector adjusting unit adjusts the duration of outputting of the voltage vectors so that the second duration becomes a duration obtained by subtracting the first duration from the predetermined time.

With respect to Claim 7, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, wherein the voltage-vector adjusting unit calculates an error accompanied by an adjustment of the duration of outputting of the voltage vectors, and adjusts the duration of outputting of the voltage vectors by correcting the voltage vectors in a current cycle with the error calculated in a previous cycle.

With respect to Claim 11, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily, wherein the voltage-vectors adjusting unit adjusts the duration of outputting of the voltage vectors so that times of outputting voltage vectors other than the zero-voltage vector also become longer than the fixed time or zero.

With respect to Claim 15, the prior art does not disclose or suggest, in combination with the limitations of the base claim and any intervening claims, primarily,

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wherein the voltage-vector adjusting unit replaces the voltage vector firstly output in the current cycle with the voltage vector lastly output in the previous cycle..

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Yamanaka (US 6,751,105) discloses recomputing the vectors if the times are not longer than a fixed value.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry Behm whose telephone number is 571-272-8929. The examiner can normally be reached on Business EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Karl Easthom can be reached on 571-2721989. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KARL EASTHOM
SUPERVISORY PATENT EXAMINER